WHAT IS CLAIMED IS:

1. Apparatus for determining one or more parameters of an electrochemical cell or battery comprising:

response sensing circuitry coupled to said cell or battery and adapted to sense time-varying electrical response of said cell or battery generated as a result of time-varying electrical excitation of said cell or battery; and,

computation circuitry coupled to said response sensing circuitry and adapted to utilize said response to evaluate elements of a circuit model comprising the series combination of a series R-L subcircuit and a plurality of parallel G-C subcircuits, said computation circuitry further adapted to evaluate one or more said parameters from values of one or more said elements.

2. The apparatus of claim 1 wherein said time-varying electrical excitation comprises current excitation and said time-varying electrical response comprises voltage response.

3. The apparatus of claim 1 wherein said time-varying electrical excitation comprises voltage excitation and said time-varying electrical response comprises current response.

4. The apparatus of claim 2 wherein a source external to said apparatus applies said time-varying electrical excitation to said cell or battery.

5. The apparatus of claim 4 wherein said source comprises a cell/battery charger or an alternator employed to charge said electrochemical cell or battery.

6. The apparatus of claim 1 including a display device coupled to said computation circuitry for conveying one or more said parameters to a user.

7. The apparatus of claim 1 wherein said computation circuitry couples to a process device controlled by said computation circuitry in accordance with the computed value or values of one or more said parameters.

8. The apparatus of claim 7 wherein said process device is a cell/battery charger charging said electrochemical cell or battery.

9. The apparatus of claim 1 wherein said computation circuitry couples to an alarm actuated in accordance with the computed value or values of one or more said parameters.

10. The apparatus of claim 1 wherein one said parameter is absolute stored charge.

11. The apparatus of claim 10 wherein said computation circuitry computes said absolute stored charge from the value of the capacitance element of a particular parallel G-C subcircuit of said electrical circuit representation.

12. The apparatus of claim 1 wherein one said parameter is exchange current.

13. The apparatus of claim 12 wherein said computation circuitry computes said exchange current from the value of the conductance element of a particular parallel G-C subcircuit of said electrical circuit representation.

14. The apparatus of claim 1 wherein one said parameter is state-of-charge.

15. The apparatus of claim 14 wherein said computation circuitry computes said state-of-charge from the value of the conductance element of a particular parallel G-C subcircuit and the value of the capacitance element of a different parallel G-C subcircuit of said electrical circuit representation.

16. The apparatus of claim 1 wherein one said parameter is total storage capacity.

17. The apparatus of claim 16 wherein said computation circuitry computes said total storage capacity from the value of the conductance element of a particular parallel G-C subcircuit and the value of the capacitance element of a different parallel G-C subcircuit of said electrical circuit representation.

18. The apparatus of claim 1 wherein one said parameter is maximum exchange current.

19. The apparatus of claim 18 wherein said computation circuitry computes said maximum exchange current from the value of the

conductance element of a particular parallel G-C subcircuit and the value of the capacitance element of a different parallel G-C subcircuit of said electrical circuit representation.

20. The apparatus of claim 1 wherein one said parameter is charge transfer conductance.

21. The apparatus of claim 20 wherein said computation circuitry computes said charge transfer conductance from the value of the conductance element of a particular parallel G-C subcircuit of said electrical circuit representation.

22. The apparatus of claim 1 wherein one said parameter is double layer capacitance.

23. The apparatus of claim 22 wherein said computation circuitry computes said double layer capacitance from the value of the capacitance element of a particular parallel G-C subcircuit of said electrical circuit representation.

24. The apparatus of claim 1 wherein one said parameter is maximum charge transfer conductance.

25. The apparatus of claim 24 wherein said computation circuitry computes said maximum charge transfer conductance from the value of the conductance element of a particular parallel G-C subcircuit and the value of the capacitance element of a different parallel G-C subcircuit of said electrical circuit representation.

26. The apparatus of claim 1 wherein one said parameter is maximum double layer capacitance.

27. The apparatus of claim 26 wherein said computation circuitry computes said maximum double layer capacitance from the value of the conductance element of a particular parallel G-C subcircuit and the value of the capacitance element of a different parallel G-C subcircuit of said electrical circuit representation.

28. The apparatus of claim 1 wherein one said parameter is absolute cranking current.

29. The apparatus of claim 28 wherein said computation circuitry computes said absolute cranking current from the value of the resistance element of said series R-L subcircuit.

30. The apparatus of claim 1 wherein one said parameter is fully charged cranking current.

31. The apparatus of claim 30 wherein said computation circuitry computes said fully charged cranking current from the value of the conductance element of a particular parallel G-C subcircuit, the value of the capacitance element of a different parallel G-C subcircuit, and the value of the resistance element of said series R-L subcircuit of said electrical circuit representation.

32. The apparatus of claim 31 wherein one said parameter is state-of-health.

33. The apparatus of claim 32 including an input device coupled to said computation circuitry wherein said computation circuitry computes state-of-health by comparing said fully charged cranking current with a reference number determined in accordance with a battery rating inputted on said input device.

34. The apparatus of claim 33 wherein said battery rating comprises a cold cranking ampere battery rating.

35. The apparatus of claim 17 wherein one said parameter is state-of-health.

36. The apparatus of claim 35 including an input device coupled to said computation circuitry wherein said computation circuitry computes state-of-health by comparing said total storage capacity with a reference number determined in accordance with a battery rating inputted on said input device.

37. The apparatus of claim 36 wherein said battery rating comprises an ampere-hour battery rating.

38. The apparatus of claim 36 wherein said battery rating comprises a reserve capacity battery rating.

39. A method for determining one or more parameters of an electrochemical cell or battery comprising:

sensing time-varying electrical response to time-varying electrical excitation of said cell or battery;

processing said time-varying electrical response to evaluate elements of a circuit model of said cell or battery comprising the series combination of a

series R-L subcircuit and a plurality of parallel G-C subcircuits; and,

determining values of one or more said parameters from values of one or more said elements.

40. The method of claim 39 wherein said time-varying electrical excitation comprises current excitation and said time-varying electrical response comprises voltage response.

41. The method of claim 39 wherein said time-varying electrical excitation comprises voltage excitation and said time-varying electrical response comprises current response.

42. The method of claim 40 including applying said time-varying electrical excitation to said cell or battery with an external source.

43. The method of claim 42 wherein said external source comprises a cell/battery charger or an alternator employed to charge said electrochemical cell or battery.

44. The method of claim 39 including displaying one or more said parameters to a user.

45. The method of claim 39 including controlling a process device in accordance with the value or values of one or more said parameters.

46. The method of claim 45 wherein said process device is a cell/battery charger charging said electrochemical cell or battery.

47. The method of claim 39 including actuating an alarm in accordance with values of one or more said parameters.

48. The method of claim 39 wherein one said parameter is absolute stored charge.

49. The method of claim 48 including determining said absolute stored charge from the value of the capacitance element of a particular parallel G-C subcircuit of said electrical circuit representation.

50. The method of claim 39 wherein one said parameter is exchange current.

51. The method of claim 50 including determining said exchange current from the value of the conductance element of a particular parallel G-C subcircuit of said electrical circuit representation.

52. The method of claim 39 wherein one said parameter is state-of-charge.

53. The method of claim 52 including determining said state-of-charge from the value of the conductance element of a particular parallel G-C subcircuit and the value of the capacitance element of a different parallel G-C subcircuit of said electrical circuit representation.

54. The method of claim 39 wherein one said parameter is total storage capacity.

55. The method of claim 54 including determining said total storage capacity from the value of the conductance element of a particular parallel G-C subcircuit and the value of the capacitance element of a different parallel G-C subcircuit of said electrical circuit representation.

56. The method of claim 39 wherein one said parameter is maximum exchange current.

57. The method of claim 56 including determining said maximum exchange current from the value of the conductance element of a particular parallel G-C subcircuit and the value of the capacitance element of a different parallel

G-C subcircuit of said electrical circuit representation.

58. The method of claim 39 wherein one said parameter is charge transfer conductance.

59. The method of claim 58 including determining said charge transfer conductance from the value of the conductance element of a particular parallel G-C subcircuit of said electrical circuit representation.

60. The method of claim 39 wherein one said parameter is double layer capacitance.

61. The method of claim 60 including determining said double layer capacitance from the value of the capacitance element of a particular parallel G-C subcircuit of said electrical circuit representation.

62. The method of claim 39 wherein one said parameter is maximum charge transfer conductance.

63. The method of claim 62 including determining said maximum charge transfer conductance from the value of the conductance element of a particular parallel G-C subcircuit and the value of the capacitance element of a

different parallel G-C subcircuit of said electrical circuit representation.

64. The method of claim 39 wherein one said parameter is maximum double layer capacitance.

65. The method of claim 64 including determining said maximum double layer capacitance from the value of the conductance element of a particular parallel G-C subcircuit and the value of the capacitance element of a different parallel G-C subcircuit of said electrical circuit representation.

66. The method of claim 39 wherein one said parameter is absolute cranking current.

67. The method of claim 66 including determining said absolute cranking current from the value of the resistance element of said series R-L subcircuit.

68. The method of claim 39 wherein one said parameter is fully charged cranking current.

69. The method of claim 68 including determining said fully charged cranking current from the value of the conductance element of a particular parallel G-C subcircuit, the value

of the capacitance element of a different parallel G-C subcircuit, and the value of the resistance element of said series R-L subcircuit of said electrical circuit representation.

70. The method of claim 39 wherein one said parameter is state-of-health.

71. The method of claim 70 including inputting a battery rating with an input device and determining said state-of-health by comparing said fully charged cranking current with a reference number determined in accordance with said battery rating.

72. The method of claim 71 wherein said battery rating comprises a cold cranking ampere battery rating.

73. The method of claim 55 wherein one said parameter is state-of-health.

74. The method of claim 73 including inputting a battery rating with an input device and determining said state-of-health by comparing said total storage capacity with a reference number determined in accordance with said battery rating.

75. The method of claim 74 wherein said battery rating comprises an ampere-hour battery rating.

76. The method of claim 74 wherein said battery rating comprises a reserve capacity battery rating.

77. Apparatus for determining one or more parameters of an electrochemical cell or battery adapted to perform the method according to claim 39.

78. Apparatus for determining absolute stored charge of an electrochemical cell or battery comprising:

response sensing circuitry coupled to said cell or battery and adapted to sense time-varying electrical response of said cell or battery generated as a result of time-varying electrical excitation of said cell or battery; and,

computation circuitry coupled to said response sensing circuitry and adapted to utilize said response to evaluate elements of a circuit model containing a plurality of parallel G-C subcircuits connected in series, said computation circuitry further adapted to evaluate said absolute stored charge from the

value of the capacitance element of a particular parallel G-C subcircuit.

79. Apparatus for determining an exchange current of an electrochemical cell or battery comprising:

response sensing circuitry coupled to said cell or battery and adapted to sense time-varying electrical response of said cell or battery generated as a result of time-varying electrical excitation of said cell or battery; and,

computation circuitry coupled to said response sensing circuitry and adapted to utilize said response to evaluate elements of a circuit model containing a plurality of parallel G-C subcircuits connected in series, said computation circuitry further adapted to evaluate said exchange current from the value of the conductance element of a particular parallel G-C subcircuit.

80. Apparatus for determining state-of-charge of an electrochemical cell or battery comprising:

response sensing circuitry coupled to said cell or battery and adapted to sense time-varying electrical response of said cell or battery generated as a result of

time-varying electrical excitation of said cell or battery; and,

computation circuitry coupled to said response sensing circuitry and adapted to utilize said response to evaluate elements of a circuit model containing a plurality of parallel G-C subcircuits connected in series, said computation circuitry further adapted to evaluate said state-of-charge from the value of the conductance element of a particular parallel G-C subcircuit and the value of the capacitance element of a different parallel G-C subcircuit.

81. Apparatus for determining total storage capacity of an electrochemical cell or battery comprising:

response sensing circuitry coupled to said cell or battery and adapted to sense time-varying electrical response of said cell or battery generated as a result of time-varying electrical excitation of said cell or battery; and,

computation circuitry coupled to said response sensing circuitry and adapted to utilize said response to evaluate elements of a circuit model containing a plurality of parallel G-C subcircuits connected in series, said computation

circuitry further adapted to evaluate said total storage capacity from the value of the conductance element of a particular parallel G-C subcircuit and the value of the capacitance element of a different parallel G-C subcircuit.

82. Apparatus for determining maximum exchange current of an electrochemical cell or battery comprising:

response sensing circuitry coupled to said cell or battery and adapted to sense time-varying electrical response of said cell or battery generated as a result of time-varying electrical excitation of said cell or battery; and,

computation circuitry coupled to said response sensing circuitry and adapted to utilize said response to evaluate elements of a circuit model containing a plurality of parallel G-C subcircuits connected in series, said computation circuitry further adapted to evaluate said maximum exchange current from the value of the conductance element of a particular parallel G-C subcircuit and the value of the capacitance element of a different parallel G-C subcircuit.

83. Apparatus for determining absolute cranking current of an electrochemical cell or battery comprising:

response sensing circuitry coupled to said cell or battery and adapted to sense time-varying electrical response of said cell or battery generated as a result of time-varying electrical excitation of said cell or battery; and,

computation circuitry coupled to said response sensing circuitry and adapted to utilize said response to evaluate elements of a circuit model containing a series R-L subcircuit in series with a plurality of parallel G-C subcircuits, said computation circuitry further adapted to evaluate said absolute cranking current from the value of the resistance element of said series R-L subcircuit.

84. The apparatus of claim 83 wherein said computation circuitry computes fully charged cranking current by correcting said absolute cranking current with a correction factor evaluated using values of a capacitance element contained in a particular parallel G-C subcircuit and a conductance element contained in a different parallel G-C subcircuit of said circuit model.

85. The apparatus of claim 84 including an input device wherein said computation circuitry computes state-of-health by comparing said fully charged cranking current with a reference number in accordance with a battery rating inputted on said input device.

86. The apparatus of claim 85 wherein said battery rating comprises a cold cranking ampere battery rating.

87. The apparatus of claim 81 including an input device wherein said computation circuitry computes state-of-health by comparing said total storage capacity with a reference number in accordance with a battery rating inputted on said input device.

88. The apparatus of claim 87 wherein said battery rating comprises an ampere-hour battery rating.

89. The apparatus of claim 87 wherein said battery rating comprises a reserve capacity battery rating.

90. Apparatus for determining a charge transfer conductance of an electrochemical cell or battery comprising:

response sensing circuitry coupled to said cell or battery and adapted to sense time-varying electrical response of said cell or battery generated as a result of time-varying electrical excitation of said cell or battery; and,

computation circuitry coupled to said response sensing circuitry and adapted to utilize said response to evaluate elements of a circuit model containing a plurality of parallel G-C subcircuits connected in series, said computation circuitry further adapted to evaluate said charge transfer conductance from the value of the conductance element of a particular parallel G-C subcircuit.

91. Apparatus for determining a double layer capacitance of an electrochemical cell or battery comprising:

response sensing circuitry coupled to said cell or battery and adapted to sense time-varying electrical response of said cell or battery generated as a result of time-varying electrical excitation of said cell or battery; and,

computation circuitry coupled to said response sensing circuitry and adapted to utilize said response to evaluate elements of a circuit model containing a

plurality of parallel G-C subcircuits connected in series, said computation circuitry further adapted to evaluate said double layer capacitance from the value of the capacitance element of a particular parallel G-C subcircuit.

92. Apparatus for determining a maximum charge transfer conductance of an electrochemical cell or battery comprising:

response sensing circuitry coupled to said cell or battery and adapted to sense time-varying electrical response of said cell or battery generated as a result of time-varying electrical excitation of said cell or battery; and,

computation circuitry coupled to said response sensing circuitry and adapted to utilize said response to evaluate elements of a circuit model containing a plurality of parallel G-C subcircuits connected in series, said computation circuitry further adapted to evaluate said maximum charge transfer conductance from the values of the capacitance element of a particular parallel G-C subcircuit and the conductance element of a different parallel G-C subcircuit.

93. Apparatus for determining a maximum double layer capacitance of an electrochemical cell or battery comprising:

response sensing circuitry coupled to said cell or battery and adapted to sense time-varying electrical response of said cell or battery generated as a result of time-varying electrical excitation of said cell or battery; and,

computation circuitry coupled to said response sensing circuitry and adapted to utilize said response to evaluate elements of a circuit model containing a plurality of parallel G-C subcircuits connected in series, said computation circuitry further adapted to evaluate said maximum double layer capacitance from the values of the capacitance element of a particular parallel G-C subcircuit and the conductance element of a different parallel G-C subcircuit.

94. A method for determining the absolute stored charge of an electrochemical cell or battery comprising:

sensing time-varying electrical response to time-varying electrical excitation of said cell or battery;

processing said time-varying electrical response to evaluate the capacitance element of a particular parallel G-C subcircuit of an electrical circuit representation of said cell or battery containing a plurality of said G-C subcircuits; and,

determining the value of said absolute stored charge from the value of said capacitance element.

95. A method for determining an exchange current of an electrochemical cell or battery comprising:

sensing time-varying electrical response to time-varying electrical excitation of said cell or battery;

processing said time-varying electrical response to evaluate the conductance element of a particular parallel G-C subcircuit of an electrical circuit representation of said cell or battery; and,

determining the value of said exchange current from the value of said conductance element.

96. A method for determining the state-of-charge of an electrochemical cell or battery comprising:

sensing time-varying electrical response to time-varying electrical excitation of said cell or battery;

processing said time-varying electrical response to evaluate the capacitance element of a particular parallel G-C subcircuit and the conductance element of a different parallel G-C subcircuit of an electrical circuit representation of said cell or battery; and,

determining the value of said state-of-charge from the value of said capacitance element and the value of said conductance element.

97. A method for determining the total storage capacity of an electrochemical cell or battery comprising:

sensing time-varying electrical response to time-varying electrical excitation of said cell or battery;

processing said time-varying electrical response to evaluate the capacitance element of a particular parallel G-C subcircuit and the conductance element of a different

parallel G-C subcircuit of an electrical circuit representation of said cell or battery; and,

determining the value of said total storage capacity from the value of said capacitance element and the value of said conductance element.

98. A method for determining the maximum exchange current of an electrochemical cell or battery comprising:

sensing time-varying electrical response to time-varying electrical excitation of said cell or battery;

processing said time-varying electrical response to evaluate the capacitance element of a particular parallel G-C subcircuit and the conductance element of a different parallel G-C subcircuit of an electrical circuit representation of said cell or battery; and,

determining the value of said maximum exchange current from the value of said capacitance element and the value of said conductance element.

99. A method for determining the absolute cranking current of an electrochemical cell or battery comprising:

sensing time-varying electrical response to time-varying electrical excitation of said cell or battery;

processing said time-varying electrical response to evaluate the resistance element of a series R-L subcircuit of an electrical circuit representation of said cell or battery; and,

determining the value of said absolute cranking current from the value of said resistance element.

100. The method according to claim 99 further applied to determining fully charged cranking current including:

processing said time-varying electrical response to evaluate the capacitance element of a particular parallel G-C subcircuit and the conductance element of a different parallel G-C subcircuit of said electrical circuit representation of said cell or battery; and,

correcting said absolute cranking current with a correction factor evaluated in accordance with values of said capacitance element and said conductance element to obtain

said fully charged cranking current.

101. The method of claim 100 further applied to determining state-of-health including:

inputting a battery rating; and,

comparing said fully charged cranking current with a reference number in accordance with said battery rating to determine said state-of-health.

102. The method of claim 101 wherein said battery rating is a cold cranking ampere battery rating.

103. The method of claim 97 further applied to determining state-of-health including:

inputting a battery rating; and,

comparing said total storage capacity with a reference number in accordance with said battery rating to determine said state-of-health.

104. The method of claim 103 wherein said battery rating is an ampere-hour battery rating.

105. The method of claim 103 wherein said battery rating is a reserve capacity battery rating.

106. A method for determining a double layer capacitance of an electrochemical cell or battery comprising:

sensing time-varying electrical response to time-varying electrical excitation of said cell or battery;

processing said time-varying electrical response to evaluate the capacitance element of a particular parallel G-C subcircuit of an electrical circuit representation of said cell or battery containing a plurality of said G-C subcircuits; and,

determining the value of said double layer capacitance from the value of said capacitance element.

107. A method for determining a charge transfer conductance of an electrochemical cell or battery comprising:

sensing time-varying electrical response to time-varying electrical excitation of said cell or battery;

processing said time-varying electrical response to evaluate the conductance element of a particular parallel G-C subcircuit of an electrical circuit representation of said cell or battery; and,

determining the value of said charge transfer conductance from the value of said conductance element.

108. A method for determining a maximum double layer capacitance of an electrochemical cell or battery comprising:

sensing time-varying electrical response to time-varying electrical excitation of said cell or battery;

processing said time-varying electrical response to evaluate the capacitance element of a particular parallel G-C subcircuit and the conductance element of a different parallel G-C subcircuit of an electrical circuit representation of said cell or battery; and,

determining the value of said maximum double layer capacitance from the value of said capacitance element and the value of said conductance element.

109. A method for determining a maximum charge transfer conductance of an electrochemical cell or battery comprising:

sensing time-varying electrical response to time-varying electrical excitation of said cell or battery;

processing said time-varying electrical response to evaluate the capacitance element of a particular parallel G-C subcircuit and the conductance element of a different parallel G-C subcircuit of an electrical circuit representation of said cell or battery; and,

determining the value of said maximum charge transfer conductance from the value of said capacitance element and the value of said conductance element.

110. Apparatus for determining the absolute stored charge of an electrochemical cell or battery adapted to perform the method according to claim 94.

111. Apparatus for determining an exchange current of an electrochemical cell or battery adapted to perform the method according to claim 95.

112. Apparatus for determining state-of-charge of an electrochemical cell or battery adapted to perform the method according to claim 96.

113. Apparatus for determining the total storage capacity of an electrochemical cell or

battery adapted to perform the method according to claim 97.

114. Apparatus for determining the maximum exchange current of an electrochemical cell or battery adapted to perform the method according to claim 98.

115. Apparatus for determining the absolute cranking current of an electrochemical cell or battery adapted to perform the method according to claim 99.

116. Apparatus for determining fully charged cranking current of an electrochemical cell or battery adapted to perform the method according to claim 100.

117. Apparatus for determining state-of-health of an electrochemical cell or battery adapted to perform the method according to claim 101.

118. Apparatus for determining state-of-health of an electrochemical cell or battery adapted to perform the method according to claim 103.

119. Apparatus for determining a double layer capacitance of an electrochemical cell or battery adapted to perform the method according to claim 106.

120. Apparatus for determining a charge transfer conductance of an electrochemical cell or battery adapted to perform the method according to claim 107.

121. Apparatus for determining a maximum double layer capacitance of an electrochemical cell or battery adapted to perform the method according to claim 108.

122. Apparatus for determining a maximum charge transfer conductance of an electrochemical cell or battery adapted to perform the method according to claim 109.

123. Apparatus for determining state-of-charge of an electrochemical cell or battery comprising:

response sensing circuitry coupled to said cell or battery and adapted to sense time-varying electrical response of said cell or battery generated as a result of time-varying electrical excitation of said cell or battery; and,

computation circuitry responsive to said time-varying response and adapted to evaluate a charge transfer conductance and a double layer capacitance, said computation circuitry further adapted to

determine said state-of-charge by combining values of said charge transfer conductance and said double layer capacitance.

124. A method for determining state-of-charge of an electrochemical cell or battery comprising:

sensing time-varying electrical response to time-varying electrical excitation of said cell or battery;

processing said time-varying electrical response to evaluate a double layer capacitance and a charge transfer conductance; and,

determining said state-of-charge by combining values of said double layer capacitance and said charge transfer conductance.

125. Apparatus for determining state-of-charge of an electrochemical cell or battery adapted to perform the method according to claim 124.

126. Apparatus for determining total storage capacity of an electrochemical cell or battery comprising:

response sensing circuitry coupled to said cell or battery and adapted to sense time-varying electrical response of said

cell or battery generated as a result of time-varying electrical excitation of said cell or battery; and,

computation circuitry responsive to said time-varying response and adapted to evaluate a charge transfer conductance and a double layer capacitance, said computation circuitry further adapted to determine said total storage capacity by combining values of said charge transfer conductance and said double layer capacitance.

127. A method for determining total storage capacity of an electrochemical cell or battery comprising:

sensing time-varying electrical response to time-varying electrical excitation of said cell or battery;

processing said time-varying electrical response to evaluate a double layer capacitance and a charge transfer conductance; and,

determining said total storage capacity by combining values of said double layer capacitance and said charge transfer conductance.

128. Apparatus for determining total storage capacity of an electrochemical cell or

battery adapted to perform the method according to claim 127.

129. Apparatus for determining absolute stored charge of an electrochemical cell or battery comprising:

response sensing circuitry coupled to said cell or battery and adapted to sense time-varying electrical response of said cell or battery generated as a result of time-varying electrical excitation of said cell or battery; and,

computation circuitry responsive to said time-varying response and adapted to evaluate a double layer capacitance, said computation circuitry further adapted to determine said absolute stored charge from the value of said double layer capacitance.

130. A method for determining absolute stored charge of an electrochemical cell or battery comprising:

sensing time-varying electrical response to time-varying electrical excitation of said cell or battery;

processing said time-varying electrical response to evaluate a double layer capacitance; and,

determining said absolute stored charge from the value of said double layer capacitance.

131. Apparatus for determining absolute stored charge of an electrochemical cell or battery adapted to perform the method according to claim 130.

132. Apparatus for determining an exchange current of an electrochemical cell or battery comprising:

response sensing circuitry coupled to said cell or battery and adapted to sense time-varying electrical response of said cell or battery generated as a result of time-varying electrical excitation of said cell or battery; and,

computation circuitry responsive to said time-varying response and adapted to evaluate a charge transfer conductance, said computation circuitry further adapted to determine said exchange current from the value of said charge transfer conductance.

133. A method for determining an exchange current of an electrochemical cell or battery comprising:

sensing time-varying electrical response to time-varying electrical excitation of said cell or battery;

processing said time-varying electrical response to evaluate a charge transfer conductance; and,

determining said exchange current from the value of said charge transfer conductance.

134. Apparatus for determining an exchange current of an electrochemical cell or battery adapted to perform the method according to claim 133.

135. Apparatus for determining a maximum double layer capacitance of an electrochemical cell or battery comprising:

response sensing circuitry coupled to said cell or battery and adapted to sense time-varying electrical response of said cell or battery generated as a result of time-varying electrical excitation of said cell or battery; and,

computation circuitry responsive to said time-varying response and adapted to evaluate a double layer capacitance and a charge transfer conductance, said computation circuitry further adapted to determine said maximum double layer capacitance from the values of said

double layer capacitance and said charge transfer conductance.

136. A method for determining a maximum double layer capacitance of an electrochemical cell or battery comprising:

sensing time-varying electrical response to time-varying electrical excitation of said cell or battery;

processing said time-varying electrical response to evaluate a double layer capacitance and a charge transfer conductance; and,

determining said maximum double layer capacitance from the values of said double layer capacitance and said charge transfer conductance.

137. Apparatus for determining a maximum double layer capacitance of an electrochemical cell or battery adapted to perform the method according to claim 136.

138. Apparatus for determining a maximum charge transfer conductance of an electrochemical cell or battery comprising:

response sensing circuitry coupled to said cell or battery and adapted to sense time-varying electrical response of said cell or battery generated as a result of

time-varying electrical excitation of said cell or battery; and,

computation circuitry responsive to said time-varying response and adapted to evaluate a double layer capacitance and a charge transfer conductance, said computation circuitry further adapted to determine said maximum charge transfer conductance from the values of said double layer capacitance and said charge transfer conductance.

139. A method for determining a maximum charge transfer conductance of an electrochemical cell or battery comprising:

sensing time-varying electrical response to time-varying electrical excitation of said cell or battery;

processing said time-varying electrical response to evaluate a double layer capacitance and a charge transfer conductance; and,

determining said maximum charge transfer conductance from the values of said double layer capacitance and said charge transfer conductance.

140. Apparatus for determining a maximum charge transfer conductance of an electrochemical

cell or battery adapted to perform the method according to claim 139.

141. Apparatus for determining a maximum exchange current of an electrochemical cell or battery comprising:

response sensing circuitry coupled to said cell or battery and adapted to sense time-varying electrical response of said cell or battery generated as a result of time-varying electrical excitation of said cell or battery; and,

computation circuitry responsive to said time-varying response and adapted to evaluate a double layer capacitance and a charge transfer conductance, said computation circuitry further adapted to determine said maximum exchange current from the values of said double layer capacitance and said charge transfer conductance.

142. A method for determining a maximum exchange current of an electrochemical cell or battery comprising:

sensing time-varying electrical response to time-varying electrical excitation of said cell or battery;

processing said time-varying electrical response to evaluate a double layer

capacitance and a charge transfer conductance; and,

determining said maximum exchange current from the values of said double layer capacitance and said charge transfer conductance.

143. Apparatus for determining a maximum exchange current of an electrochemical cell or battery adapted to perform the method according to claim 142.